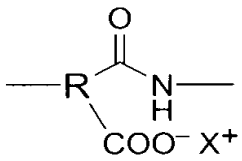
What is claimed is:

1. A polyimide article formed from a polyamic acid salt precursory article by thermal or chemical imidization, wherein the said polyamic acid salt precursory article is formed from a casting solution containing from 0.01% to 20 % by volume of tertiary amines or water, wherein said polyamic acid salt precursor contains the following radicals:



wherein R is a substituted or unsubstituted aromatic, alicyclic, heterocyclic, or aliphatic radical; and

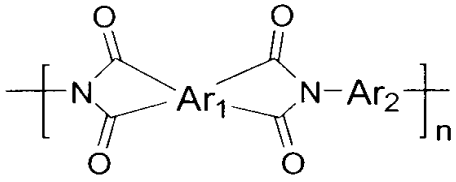
X is an ammonium ion, a phosphonium ion, a sulfonium ion, a protonated tertiary amine or a quaternary amine or a mixture thereof.

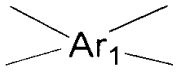
2. The polyimide article of claim 1, wherein said article is a fluid separation membrane.

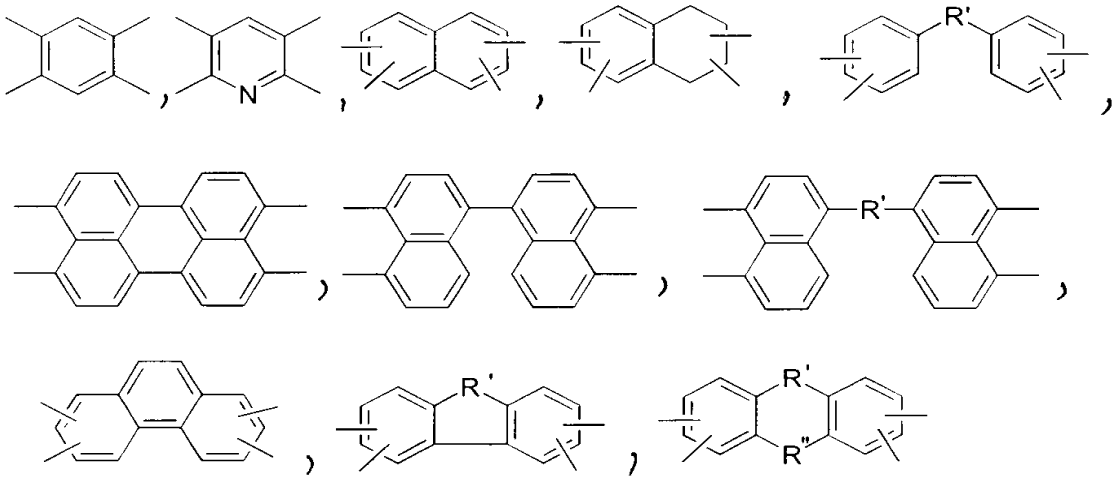
3. The fluid separation membrane of claim 2 wherein said tertiary amine is the same as the tertiary amine used to form the counter-ion X of said polyamic acid salt polymer.

4. The fluid separation membrane of claim 2 wherein said tertiary amine is different from the tertiary amine used to form the counter-ion X of said polyamic acid salt polymer.

5. The fluid separation membrane of claim 2 wherein the said polyimide is an aromatic polyimide of the following formula:

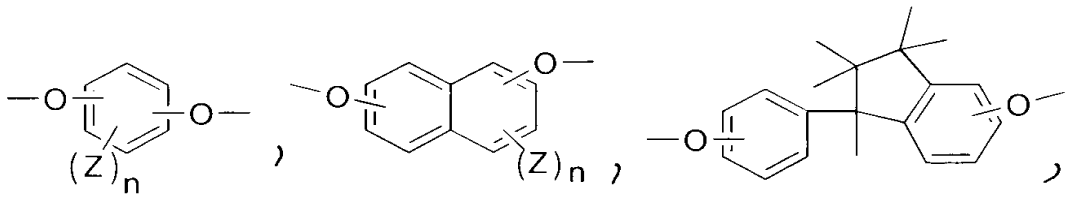


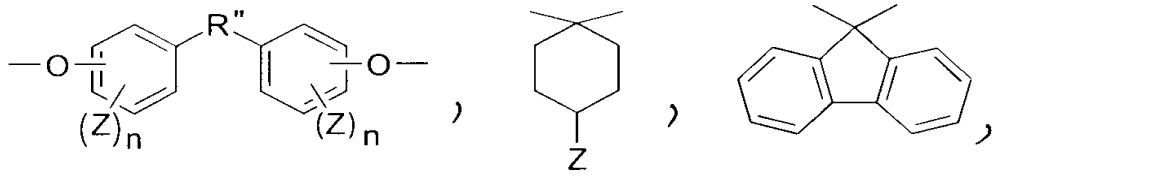
where  is independently

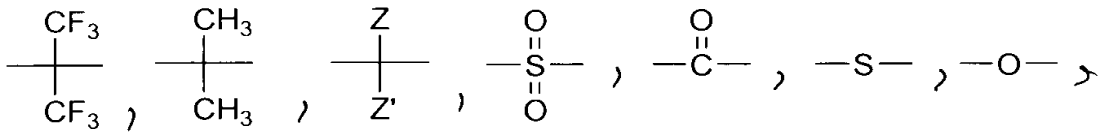


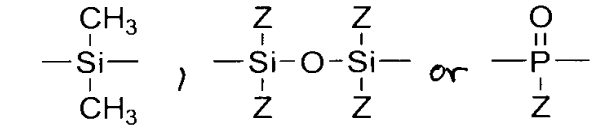
or mixtures thereof;

—R'— is

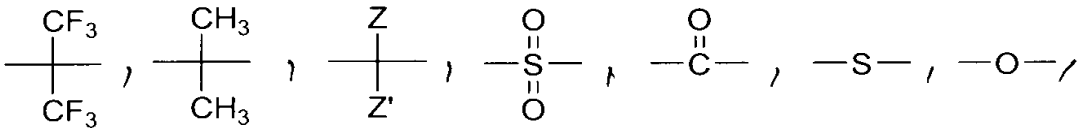


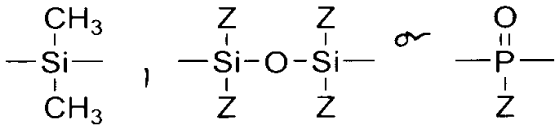




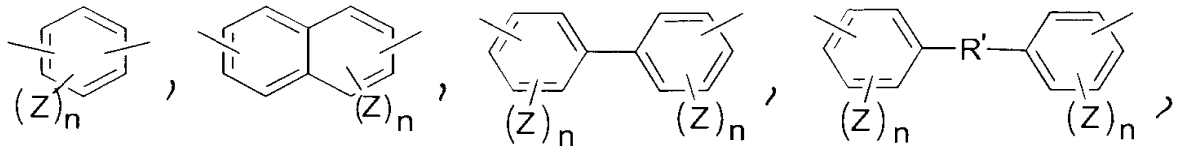


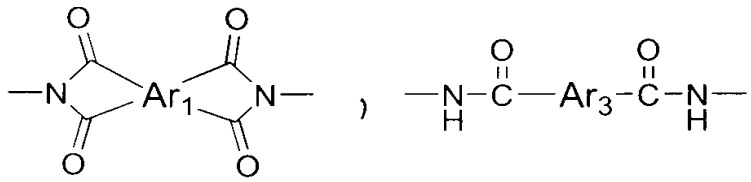
—R"— is





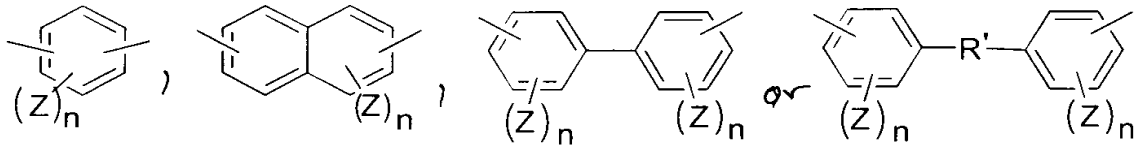
where $-Ar_2-$ is independently





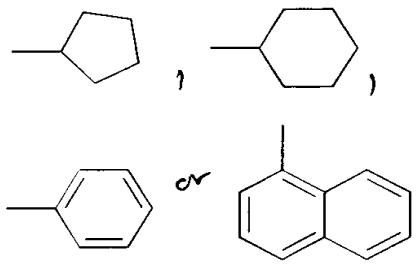
or mixtures thereof; where Ar_1 is defined as above;

$-Ar_3-$ is



Z and Z' are:

-H, $-CH_3$, $-CH_2CH_3$, $-CH_2CH_2CH_3$,iso-propyl, iso-butyl, tert-butyl, -Br, -Cl, -F, $-NO_2$, -CN,



where n is between 1 to 4.

6. The fluid separation membrane of claim 2 wherein the said counter ion of the said polyamic acid

salt is a protonated tertiary amine, tetraalkylammonium and ammonia.

7. The fluid separation membrane wherein said protonated tertiary amine is protonated trimethylamine, protonated triethylamine, protonated tri- protonated n-propylamine, protonated tri-n-butylamine, protonated tri-n-hexylamine or, protonated dimethylalkylamine.

8. A polyamide fluid separation membrane wherein said polyimide membrane is a composite membrane formed by the following process: a) forming a coating solution of the polyamic acid salt polymer in a solvent system that contains from 0.01% to 20 % by volume of tertiary amine or water; b) applying said coating solution to a porous substrate to form a coated substrate; c) solidifying said coating solution by drying or by immersing said coated substrate into a non solvent; d) converting said coated substrate having said solidified coating _____ into a final polyimide composite membrane by thermal or chemical treatment.

9. The process of claim 8 wherein said solvent system is comprised of alcohols and their mixtures with tertiary amines and water.

10. The process of claim 8 wherein said porous substrate is a hollow fiber.

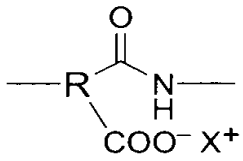
11. The process of claim 8 wherein said hollow fiber substrate is formed from polysulfone, polyimide, polyamide, polyolefine, or polyether imide.

12. The process of claim 8 wherein said thermal treatment is carried out at a temperature between 100 and 300 degrees centigrade.

13. The fluid separation membrane of claim 8 wherein said fluid is a gas mixture.

14. The fluid separation membrane of claim 8 wherein said polyimide is more than 50 % imidized.

15. A polyimide article formed from a polyamic acid salt precursor article by thermal imidization, wherein the said polyamic acid precursor article is formed from a casting solution containing a catalyst, and said polyamic acid salt precursor contains the following radicals:



wherein R is a substituted or unsubstituted aromatic, alicyclic, heterocyclic, or aliphatic radical; and

X is an ammonium ion, a phosphonium ion, a sulfonium ion, a protonated tertiary amine or a quaternary amine or a mixture thereof.

16. The polyimide article of claim 15, wherein said article is a polyimide fluid separation membrane.

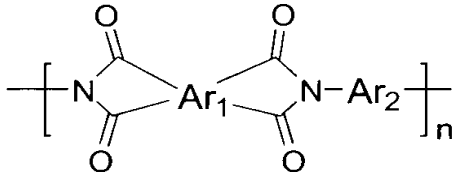
17. The membrane of claim 16 wherein said catalyst has an acid group that is neutralized with a tertiary amine.

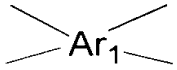
18. The polyimide fluid separation membrane of claim 16 wherein the said thermal imidization temperature is between 100 to 200 degrees Centigrade.

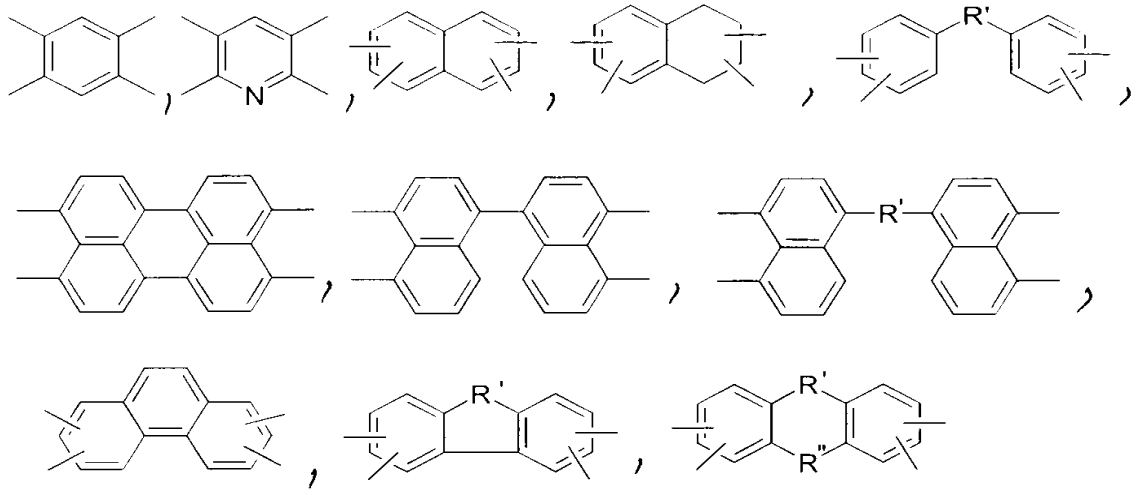
19. The membrane of claim 16 wherein said polyimide membrane is a composite membrane.

20. The membrane of claim 16 wherein said polyimide membrane is an asymmetric membrane.

21. The fluid separation membrane of claim 16 wherein said polyimide is an aromatic polyimide of the following formula:

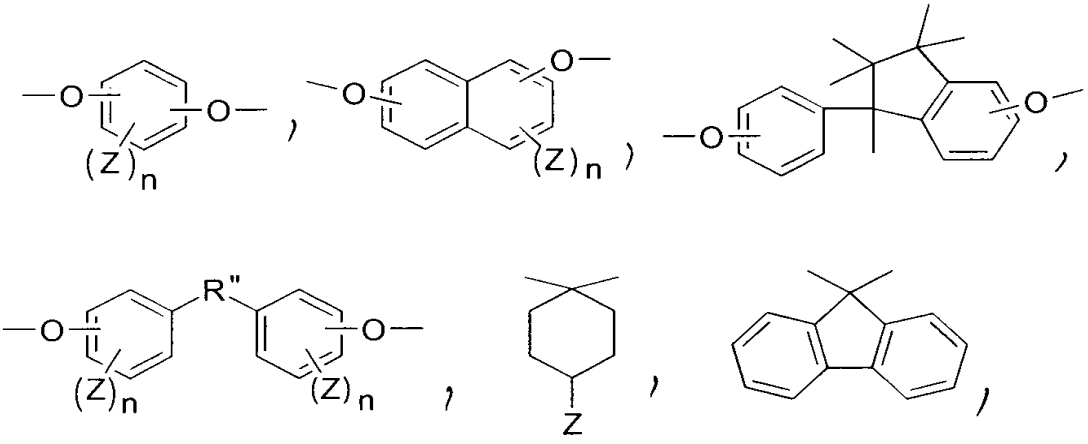


where  is independently

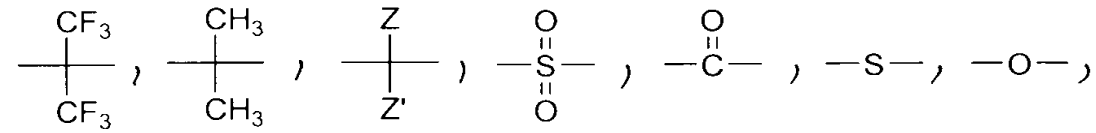


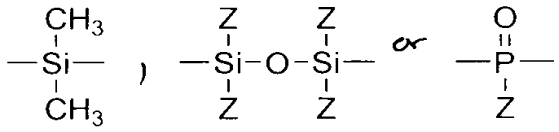
or mixtures thereof;

—R'— is

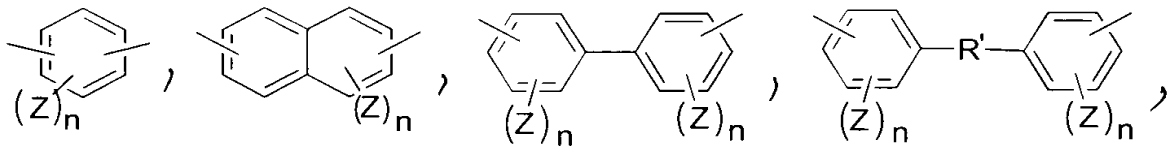


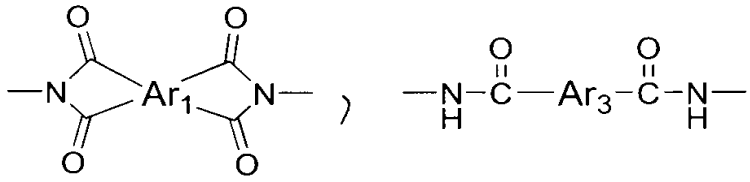
—R"— is





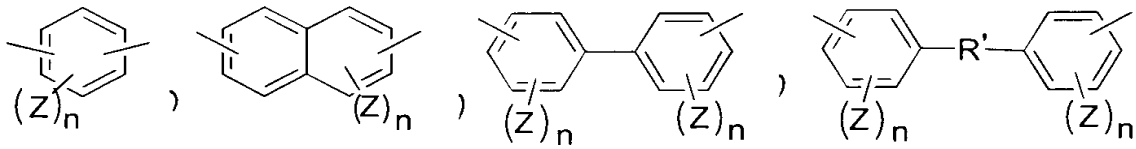
where $-Ar_2-$ is independently





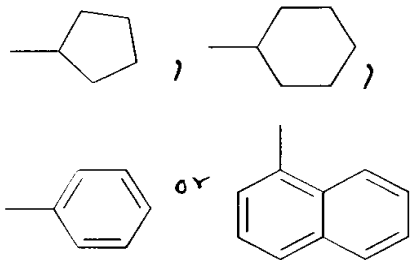
or mixtures thereof, where Ar_1 is defined as above;

$-Ar_3-$ is



Z and Z' are:

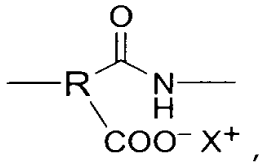
-H, -CH_3, -CH_2CH_3, -$CH_2CH_2CH_3$,iso-propyl, iso-butyl, tert-butyl, -Br, -Cl, -F, -NO_2, -CN,



where n is between 1 to 4.

22. The fluid separation membrane of claim 16 wherein the said polyamic acid salt has a counter ion that is a protonated tertiary amine, tetraalkylammonium or ammonia.

23. A polyimide fluid separation membrane formed from a polyamic acid salt precursor membrane by a chemical imidization process; said process comprising contacting said polyamic acid salt precursor membrane with a diluted dehydration agent in an inert solvent; wherein said polyamic acid salt precursor contains the following radicals:



wherein R is a substituted or unsubstituted aromatic, alicyclic, heterocyclic, or aliphatic radical; and

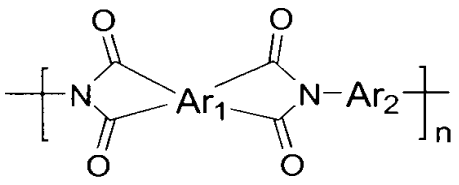
X is an ammonium ion, a phosphonium ion, a sulfonium ion, a protonated tertiary amine or a quaternary amine or a mixture thereof.

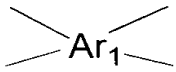
24. The polyimide membrane of claim 23 wherein the said inert solvent is hexane, cyclohexane, octane, pentane, ethyl ether, propyl ether, butyl ether, methyl t-butyl ether, petroleum ether, perfluorinated alkanes, perfluorinated alkyl ether, acetone or methyl ethyl ketone.

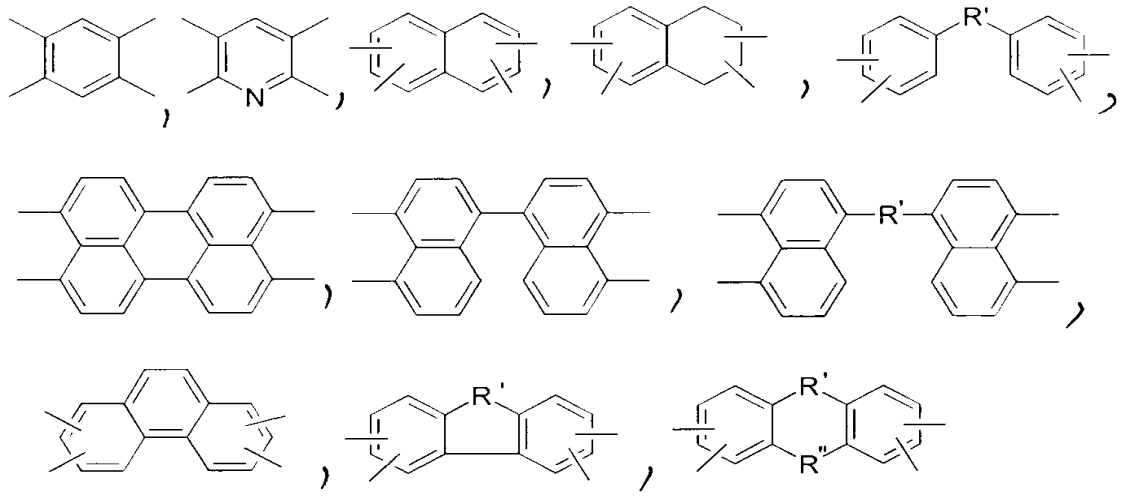
25. The polyimide membrane of claim 23 wherein the said dehydration agent is an acid anhydride, acid chloride or an acetal.

26. The polyimide membrane of claim 23 wherein the concentration of said dehydration agent in said inert solvent is from 0.1% to 5% by volume.

27. The fluid separation membrane of claim 23 wherein said polyimide is an aromatic polyimide of the following formula:

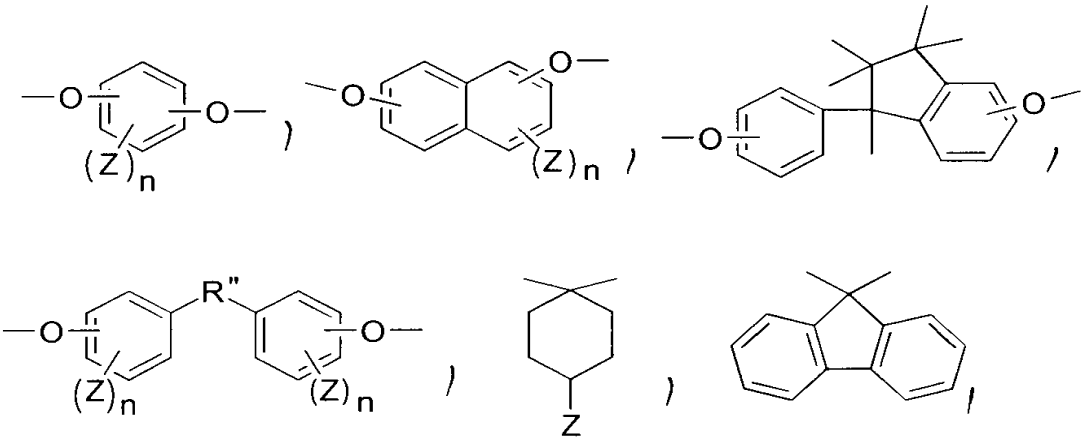


where  is independently

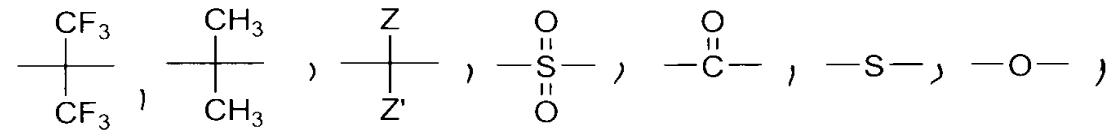


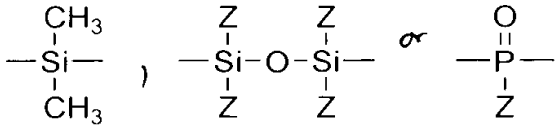
or mixtures thereof.

—R'— is

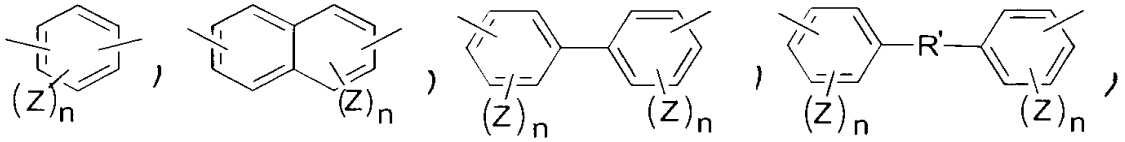


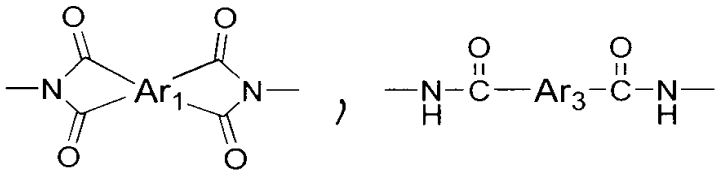
—R"— is





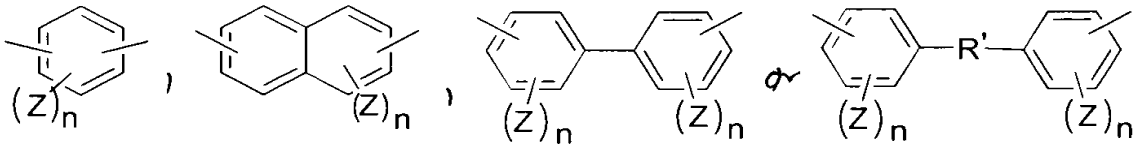
where $-Ar_2-$ is independently





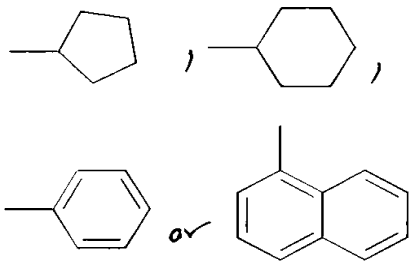
or mixtures thereof; where Ar_1 and Z are defined as above;

$-Ar_3-$ is



Z and Z' are:

-H, $-CH_3$, $-CH_2CH_3$, $-CH_2CH_2CH_3$,iso-propyl, iso-butyl, tert-butyl, -Br, -Cl, -F, $-NO_2$, -CN,



where n is between 1 to 4.

28. The fluid separation membrane of claim 23 wherein the said counter ion of the said polyamic acid salt is a protonated tertiary amine, tetraalkylammonium or ammonia.